

PATENT SPECIFICATION

620,354

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Application Date: Jan. 15, 1947. No. 1350/47.

Complete Specification Accepted: March 23, 1949.

(Under this Application, which was originally made under Section 91 of the Patents and Designs Acts, 1907 to 1946 a Specification was laid open to public inspection on Aug. 8, 1947.)

Index at acceptance:—Class 94(i), G(1f: 3: 4).

COMPLETE SPECIFICATION

Package with Means for Opening It

I, LEROY LINCOLN SALFISBERG, a citizen of the United States of America, of 303, Hartford Road, South Orange, State of New Jersey, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates in general to the packaging or wrapping of articles such as tablets or pills, or granular or powdered material, paste, liquid, in containers or compartments whose thin flexible walls are formed of sheet material, for example 15 "Cellophane", "Pliotfilm", (these being Registered Trade Marks) or metal foil and especially sheet material which itself is thermoplastic and can be softened by heat or has a thermoplastic or adhesive coating, so that juxtaposed layers of the sheet material can be caused to adhere together 20 by application of heat and pressure, or pressure alone, to form a seal.

25 More particularly the invention contemplates a package of the type which comprises opposed layers of flexible packaging material sealed or bonded together in zones which form the margins or boundaries that encircle a compartment 30 whose walls are the spaced portions of said layers bounded by said sealed zones.

It is well known that many articles and materials are deleteriously affected and in some cases spoiled by prolonged exposure 35 to air, and modern packaging methods have been devised for enclosing such articles or materials in hermetically sealed compartments or receptacles from which substantially all air is exhausted to provide a 40 partial vacuum. However, such receptacles generally have been of the rigid-walled, bottle or can type, and one object of my invention is to provide an improved flexible-walled package the compartment 45 whereof containing the article or material shall be air-tight, hermetically sealed and substantially devoid of air.

Another object is to provide a package of the specific character described such that the vacuum within the compartment shall draw the opposed flexible walls around the article or material in the compartment and into contact with each other so as to relieve the sealed zones of outward pressure from the article or material and also to hold the article or material against movement in the compartment. 50 55

In packages of the general nature hereinbefore described, considerable difficulty sometimes is encountered in separating the superposed layers of the packaging material that have been sealed together to form the walls of a package, and accordingly another object of my invention is to provide a package of this character that shall embody an improved structure to facilitate opening of the package by separating or pulling apart the superposed layers of the packaging material. 60 65 70

A further object is to provide such a package wherein the sealing walls shall comprise an improved construction and combination of zones wherein the layers of material are sealed together and other zones wherein said layers are unsealed, whereby opening of the package by separating the layers shall be facilitated and at the same time a secure closing and sealing of the commodity-containing compartment shall be ensured. 75 80

With the foregoing objects in view the invention consists in a vacuum package whose walls comprise opposed approximately flat flexible layers of air-proof material hermetically sealed together in zones forming and bounding a vacuum compartment having therein material to be packaged, there being portions of the walls of said compartment that are unsealed between said sealed zones and the margins of said material and are pressed into snug contact with each other and with said margins of the material by the atmospheric pressure outside the compartment, whereby said material normally is held against 85 90 95

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movement in said compartment, and said portions of the walls may yield apart to compensate for pressure on the outside of said walls tending to displace said material 5 in the compartment.

In the accompanying drawings:

Figure 1 is a perspective view of a package embodying the invention.

Figure 2 is an enlarged vertical longitudinal sectional view taken on the plane of the line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 2 showing the first step in the opening of the package.

Figure 4 is a view similar to Figure 3 showing the package partially opened.

Figure 5 is a perspective view of another form of package embodying the invention, and

Figure 6 is an enlarged vertical longitudinal sectional view taken on the plane of the line 6—6 of Figure 5.

Specifically describing the embodiment of the invention illustrated in Figures 1 to 4 inclusive, the package includes two layers 1 and 2 of the packaging material such as "Cellophane", "Pliofilm", (these as above mentioned, being Registered Trade Marks), or metal foil, which are sealed together in zones 3 to form the margins or boundaries of a compartment 4 whose walls are spaced portions of said layers bounded by said sealed zones. Within the compartment 4 may be enclosed the material to be packaged, for example, a tablet or a powder such as medicinal powders or face powder, and the commodity such as the tablet or powder is enclosed within a vacuum. In other words, the air is exhausted from the compartment 4 in any suitable manner as the package is formed, for example, according to the method and machine described in my co-pending application No. 22949/46 (Serial No. 615,368).

Along one margin, the layers 1 and 2 are unsealed or free from each other, as indicated at 5, these unsealed margins providing facile finger grips by which the two layers may be pulled apart, as indicated in Figures 3 and 4 to open the package and release and discharge the contents of the compartment. Desirably, the unsealed edge portion 5 of one of the layers 1 and 2 projects beyond the corresponding edge portion of the other layer to facilitate initial separation of the layers for grasping with the fingers to peel apart the two layers.

The shape of the compartment 4 and of the sealed zones 3 may be widely varied, as desired, but in Figure 1 the compartment 4 has a polygonal, particularly a pentagonal contour with one of the angles 6 extending toward the free unsealed edges 5 of the package and disposed approximately mid-way of the width of the package. With

such a construction, during opening of the package, the sealed zones 3 are initially pulled apart at the apex of the angle 6 and then progressively pulled apart along the sides of the compartment. The diagonally or inclined sealed zones leading inwardly towards the compartment 4 from the apex of the angle 6 ensure a gradual distribution of tension on the layers 1 and 2 incident to the pulling of the layers apart, so that the tendency to wrinkling or tearing of the layers of the packaging material is minimized, and it is not necessary to exercise any special care to apply the tension to the layers uniformly throughout the width thereof.

A modification of the invention is shown in Figures 5 and 6, where the portion of the sealed zones 7 along which the layers 8 and 9 of packaging material are connected together, is in the form of an arc projecting from the commodity compartment 10 to the free or unsealed edges 11 of said layers. This form of compartment may be particularly desirable where the commodity is a tablet or other solid or rigid article, such as indicated at 12, the arcuate or curved portion 13 of the sealed zone has the same effect during the opening of the package as do the inclined portions leading inwardly from the angle 6 in the form of the invention shown in Figure 1.

It will be observed that as the compartments 4 and 10 are evacuated or are vacuous the sub-atmospheric pressure or vacuum in the compartments will cause the walls of the compartments to be drawn tightly around the tablet or other substance in the compartment and also tightly together in the zones between the margins of the article or substance and the sealed zones of the package as indicated at 14. This relieves the outward pressure on the sealed portions of the package that might be caused by outward pressure of the articles incident to sliding or movement of the articles in the compartments toward the sealed zone.

Where the substance in the compartment is a powder, the above-mentioned action of the vacuum is especially effective in preventing spreading of the powder in the compartment and compensating for pressure on the walls of the compartment which would have a tendency to cause the powder to spread, the unsealed portions of the walls being yieldable under such pressure.

It will be understood by those skilled in the art that any desired number of articles may be placed in each compartment and that the compartment may be made of various sizes and shapes depending upon the material to be packaged. It will also be understood that the invention may be

utilized in packaging powder by first forming the powder into tablets, sealing the tablets in the compartments and thereafter crushing the tablets into powder form by application of pressure, as between rolls or belts, upon the opposite walls of the compartment.

It is of course essential, if the package is to be opened by peeling of the layers apart, that an adhesive or thermoplastic coating be such as to permit the peeling action. Also, the packaging material must be such as to permit such action. On the other hand, where the package may be opened by simply tearing the layers, the seal may be tighter and the packaging material may be, for example, "Cellophane" or other easily tearable material.

It may be desirable in some instances to provide for an initial breaking of the vacuum in the compartment before the tearing or peeling action has progressed substantially, and for this purpose the layers may be left unsealed in a small zone within the portion of the sealed zone closest to the free edges of the layers, as indicated at 15, so that only a relatively small area 16 of the sealed zone needs to be unsealed to establish communication through the unsealed zone 15 between the atmosphere and the interior of the compartment. After the vacuum has thus been broken, it is relatively easier to peel the layers apart because, as will be understood by those skilled in the art, the vacuum itself has the effect of holding the layers in tight contact with each other, in addition to the holding effect incident to the sealing of the layers together.

In all forms of the invention, to open the packages, the finger-grip flaps 5 or 11 are gripped initially at points about midway of their widths so that the tension applied to said flaps to separate the layers will be exerted on the sealed zones from a point in the perimeter thereof, e.g., the apex of the angle 6, simultaneously inwardly toward the compartment and obliquely or diagonally from and at opposite sides of the point of application of said tension to said flaps, the sealed zones having portions that are in diverging relation to each other away from the area of the flaps on which tension is

initially applied, which is along the longitudinal median line of the flaps.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A vacuum package whose walls comprise opposed approximately flat flexible layers of air-proof material hermetically sealed together in zones forming and bounding a vacuum compartment having therein material to be packaged, there being portions of the walls of said compartment that are unsealed between said sealed zones and the margins of said material and are pressed into snug contact with each other and with said margins of the material by the atmospheric pressure outside the compartment, whereby said material normally is held against movement in said compartment, and said portions of the walls may yield apart to compensate for pressure on the outside of said walls tending to displace said material in the compartment.

2. A vacuum package as claimed in claim 1 wherein the material in said compartment is a fluent material.

3. A vacuum package as claimed in claim 1 or 2 wherein said layers in one of said sealed zones can be manually pulled apart to open said compartment, and a marginal portion of each of said layers extends substantially beyond said sealed zone and in opposed unsealed relation to a portion of the other layer to form finger-grip flaps for initiating separation of said layers, said sealed zone being shaped and related to said flaps so that tension applied to said flaps to separate said layers will be exerted on said sealed zone from a point in the perimeter thereof simultaneously inwardly toward said compartment and obliquely in opposite directions from the point of application of said tension to said flaps.

4. A vacuum package as claimed in claim 1 constructed and arranged substantially as herein described with reference to and as illustrated in the accompanying drawings.

Dated this 14th day of January, 1947.

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Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1949.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which
copies, price 2s. 0d. each (inland) 2s. 1d. (abroad) may be obtained.

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